

CLAIMS

1. An apparatus for adhering paint chips in rows on sheets at predetermined locations thereon, the apparatus comprising:

5 a plurality of stations including an adhesive applying station upstream from swatch applying stations that deposit paint chips onto adhesive transferred to the sheets at the adhesive station;

10 a conveyor for advancing the sheet through the plurality of stations;

a sheet feeder upstream of the conveyor for sequentially supplying the sheets to the conveyor;

15 a gripping mechanism connected to the conveyor and having an open state for receiving sheets and a closed state for holding sheets received therein; and

20 a drive system for the conveyor and sheet feeder that coordinates timing of the supply of the sheets by the sheet feeder to the gripping mechanism so that the gripping mechanism shifts between the open and closed states thereof as the sheet is received therein with the gripping mechanism closing onto the received sheet for pulling the sheet downstream through the stations.

25 2. The apparatus of claim 1 wherein the gripping mechanism includes pivotal members having ends that are pivoted away from each other in the open state to face upstream toward the sheet feeder, the ends being pivoted toward each other in the closed state to clamp onto the sheet for pulling the sheet downstream on the conveyor.

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3. The apparatus of claim 1 wherein the conveyor is an endless conveyor having a downstream travel path between a sheet supply end and a sheet discharge end with the stations therebetween, and

35 opening mechanisms at predetermined positions at the

sheet supply and discharge ends of the endless conveyor which cooperate with the gripping mechanism to shift the gripping mechanism to the open state for receiving the sheets at the supply end and for releasing the sheets at the discharge end.

4. The apparatus of claim 1 wherein the gripping mechanism includes pivotal members, and

a cam mechanism at a predetermined position along the conveyor adjacent the sheet feeder for pivoting the gripping mechanism members to the open state as an incidence of the travel of the gripping mechanism attached to the conveyor past the cam mechanism.

5. The apparatus of claim 1 wherein the gripping mechanism includes a biasing mechanism for urging the pivotal members to the closed state with a predetermined bias force to securely hold the sheets received therein with the cam mechanism being operable to shift the pivotal members to the open state against the predetermined bias force.

6. The apparatus of claim 1 wherein the conveyor includes an upstream end adjacent the sheet feeder and lateral guides at the upstream end that are adjustable to align the sheets received from the feeder on the conveyor for downstream travel through the stations with the gripping mechanism operable between the guides to hold the sheets and pull the aligned sheets through the stations without need for additional guides associated with the stations.

7. An apparatus for adhering swatches in rows on sheets at predetermined locations thereon, the apparatus including:

an adhesive applying station for depositing adhesive on the predetermined locations on the sheet;

one or more swatch applying stations for placing swatches on the adhesive at the predetermined locations  
5 on the sheet;

a single set of sheet engaging members associated with a sheet for advancing the sheet through the adhesive applying station and the swatch applying stations.

10 8. An apparatus according to claim 7 wherein the sheet engaging members have low profiles so as to fit between closely spaced operating members in operating areas of the adhesive applying station and the swatch applying stations.

15 9. A method of forming sheets having swatches applied at predetermined locations thereon, the method comprising:

feeding a sheet to a gripper mechanism;  
20 gripping a leading edge of the sheet with a gripper mechanism;

pulling the sheet with the gripper mechanism in a downstream direction through an adhesive applying station;

25 applying glue to the sheet at predetermined swatch locations at the adhesive applying station;

pulling the sheet in the downstream direction through one or more swatch stations with the same gripper mechanism that pulls the sheet through the adhesive  
30 applying station;

applying one or more swatches to the sheet at the predetermined swatch locations having glue thereon when the sheet is at the swatch station; and

releasing the gripper mechanism from the sheet.

10. The method of claim 9 wherein the leading edge  
of the sheet is gripped by opening jaws of the gripper  
mechanism, moving the leading edge of the sheet between  
the jaws, and closing the jaws on the sheet at the  
5 leading edge thereof.

11. The method of claim 10 wherein the jaws of the  
gripper mechanism are opened by camming the jaws away  
from each other as an incidence of the travel of the  
10 gripper mechanism in the downstream direction.

12. The method of claim 10 wherein the leading  
edge of the sheet is moved between the jaws by lifting  
the leading edge of the sheet off from a feeding tray  
15 upstream of the gripper mechanism.

13. The method of claim 12 wherein the leading  
edge of the sheet is lifted from the feeding tray by  
drawing the leading edge of the sheet against a suction  
20 head and rotating the suction head and coordinating the  
timing of the suction head rotation and the opening of  
the jaws to shift the leading edge of the sheet into the  
open jaws.

14. The method of claim 10 wherein the jaws of the  
gripper mechanism are closed on the leading edge of the  
sheet by pivoting the jaws toward each other under the  
influence of a predetermined bias force.

15. The method of claim 9 wherein the sheet is  
pulled through the swatch applying stations by advancing  
the gripper mechanism in the downstream direction with  
the sheet via an endless drive chain traveling through  
the swatch applying stations.

16. The method of claim 9 wherein the sheet is released from the gripper mechanism by opening the jaws of the gripper mechanism as the sheet continues travel in the downstream direction and shifting the gripper  
5 mechanism away from the path of downstream travel.

17. The method of claim 16 wherein the jaws of the gripper mechanism are opened by camming the jaws away from each other as an incidence of the travel of the  
10 gripper mechanism in the downstream direction.

18. An apparatus for moving a sheet through machinery for applying swatches, the apparatus comprising:

15 a feeding station where a sheet is separated from a plurality of sheets in a stack;

a chain;

a gripper mechanism disposed on the chain adapted for gripping the sheet;

20 an adhesive applying station for applying glue to the sheet;

one or more swatch applying stations for applying one or more swatches to the sheet;

25 a receiving station for receiving the sheet after the sheet has been through the adhesive applying station and the swatch applying station;

wherein the gripper mechanism has an open position and a closed position;

30 wherein the gripper mechanism in the closed position pulls the sheet from the feeding station through the adhesive applying station and through the swatch applying station to the receiving station.

19. Apparatus in accordance with claim 18 wherein  
35 the gripper mechanism includes an upper jaw and a lower

jaw pivotally hinged together by a pivot pin.

20. Apparatus in accordance with claim 18 wherein  
an end of the upper jaw has a gripping arm extending  
5 therefrom.

21. Apparatus in accordance with claim 20 wherein  
an end of the lower jaw has a gripping tab protruding  
therefrom.  
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22. Apparatus in accordance with claim 18 wherein  
the chain revolves around a forward gear with a cam  
thereby by the feeding station and a rearward gear with a  
cam thereby by the receiving station.  
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23. Apparatus in accordance with claim 22 wherein  
the lower jaw pivots about the pivot axis relative to the  
upper jaw to bring the gripper mechanism to the open  
position during contact with the cam by the forward gear  
or the rearward gear.  
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24. Apparatus in accordance with claim 21 wherein  
the gripper mechanism is biased towards the closed  
position by a spring, wherein the gripping arm of the  
25 upper jaw contacts the gripping tab of the lower jaw when  
the gripper mechanism is in the closed position.

25. Apparatus in accordance with claim 18 wherein  
the gripper mechanism pulls the sheet along one or more  
30 plates disposed beneath the adhesive station and the  
swatch applying station.

26. Apparatus in accordance with claim 25 wherein  
the plates are arranged with slots for the gripper  
35 mechanism to protrude through.

27. An apparatus for moving a sheet through machinery for applying swatches, the apparatus comprising:

- a driven sprocket with a cam thereby;
- 5 an idler sprocket with a cam thereby;
- an endless drive chain extending between the driven sprocket and the idler sprocket;
- an upper jaw and a lower jaw rotatably hinged together on the drive chain;
- 10 a spring biasing the upper jaw and the lower jaw into contact;

wherein the upper jaw is moved out of contact with the lower jaw when the upper jaw is in contact with the cam by the driven sprocket or the idler sprocket.

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28. An apparatus in accordance with claim 27 wherein a sheet is inserted between the upper jaw and the lower jaw when the upper jaw is in contact with the cam by the idler sprocket.

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29. An apparatus in accordance with claim 28 wherein one or more suction heads insert the sheet between the upper jaw and the lower jaw when the upper jaw is in contact with the cam by the idler sprocket.

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30. An apparatus in accordance with claim 28 wherein the sheet is gripped between the upper jaw and the lower jaw when the upper jaw is not in contact with the cam by the idler sprocket.

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31. An apparatus in accordance with claim 28 wherein the gripper mechanism with the sheet gripped between the upper jaw and the lower jaw is pulled by the drive chain through an adhesive applying station and one  
35 or more swatch applying stations.

32. An apparatus in accordance with claim 28 wherein the sheet is removed from between the upper jaw and the lower jaw when the upper jaw is in contact with the cam on the driven sprocket.